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ABSTRACT

A study of small-scale farmers in Polk County, Oregon, examined characteristics of, and variations among, small-scale farmers and developed some guidelines for assistance programs targeted for such a group. During the months of May, June, and July of 1978 an average of 4 days a week was spent locating and interviewing 44 small farm operators in Polk County. A special effort was made to allow respondents to express themselves freely, and lengthy interviews resulted. Based on a number of variables, four types of small-scale farmers emerged: type I (part-time rural residential farmers), type II (alternative agriculturalists), type III (older farmers and retirees), and type IV (aspiring commercial farmers). Small-scale farmers were found to be self-reliant, to have a strong work ethic, to view farming as a way of life, to be committed to farming, and to possess anti-government, anti-institutional sentiment. As far as the Cooperative Extension Service is concerned, programs should be structured so that small-scale farmers themselves participate in program planning, and retain some control as the program develops. Despite prevailing anti-institutional sentiment, only 16% of the respondents expressed an unfavorble opinion of the Cooperative Extension Service, and 30% expressed a desire for more frequent contact with their extension agent. (BRR)

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Small-Scale Farming:
a portrait from Polk County, Oregon

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introduction

With growing awareness of the fact that small-scale farmers are an important embodiment of traditional American values, new interest has been generated in ensuring their ultimate survival. Small-scale farmers, however, are significant not only for the social values they represent, but also for their sheer numbers. They make an important contribution to strengthening the economic base and enhancing the social environment of rural communities.[1] Although farmers with gross farm product sales of less than $40,000 account for only 15 percent of Oregon's farm product sales, they constitute 80 percent or 21,446 of the 26,753 farmers in the state.[2]

This study of small-scale farmers in Polk County, Oregon was conducted as part of a larger project designed to assess the resources, needs, and goals of small-scale farmers in selected counties in five western states. This paper will discuss the characteristics of and variations among small-scale farmers in Polk County, and suggest some guidelines for assistance programs targeted for such a group.

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[1] The relationship between the existence of small farms and the economic and social viability of rural communities is discussed in a book by Walter Goldschmidt, *As You Sow: Three Studies in the Social Consequences of Agribusiness* (Montclair, New Jersey; Allanheld, Osmun; 1978). Additional information on this topic is presented in a University of California study entitled, "The Family Farm in California: Report of the Small Farm Viability Project," submitted to the State of California, November, 1977. (See in particular the final report of the Community Services Task Force contained therein.)

[2] 1974 Oregon Census of Agriculture.

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history and setting

Polk County lies astride the 45th parallel on the west-central margin of Oregon's Willamette Valley. It has a temperate-to-mediterranean growing climate, averaging 52°F with cool, moist winters and hot summers. Annual rainfall nears 40 inches, distributed mostly between November and June. The growing season is moderately long but variable.

Bordered on the east by the Willamette River, Polk County rises from fertile bottom lands along the Willamette and its tributaries, the Luckiamute and South Yamhill Rivers, to higher terrace lands of varying fertility, rolling foothills, and finally to highly dissected uplands of the Coast Range on the west. In addition, it is transected in the northeast by the upthrust Eola Hills with their many spurs. On the whole, the county presents a varied landscape of numerous microenvironments dictated by slope, aspect, local rainfall, drainage, and depth of soil weathered from varying substrata. This diversity of landscape appears to have been a historical advantage to smaller family farms and speciality farms, particularly in foothill areas. Polk County has one of the highest percentages of small farms to total farms among Oregon's 36 counties.

Polk County was an area of early settlement in the Willamette Valley. Under the Donation Land Act of 1850, the better drained prairie terraces were initially divided in half-section (320-acre) or section blocks among the original settlers. Wheat was the premiere commercial crop, and was shipped by steamboat downriver to Portland. Settlers arriving later were able to obtain 160-acre grants, but by then only steeper ground or wooded, swampy flood plain remained, which was unsuitable for growing wheat. Once cleared or drained, however, these marginal lands were among the most productive in the county. Many of the original section grants form the core of present large holdings in the county, while others have been subdivided such that 80- to 160-acre family farms are found even on the valley floor. Prune and cherry orchards became widespread commercial ventures in the foothills, and rivaled wheat and beef for the distance of their markets. Thriving on the bottom lands were small dairies, and poultry and hog operations (often combined), shipping their products by rail to Portland 60 miles away.

The social ferment and migrations of the Depression years, together with the advent of the Second World War, wrought many changes in Polk County's evolving rural communities. Refugees from the Plains Dustbowl began to arrive; often starting with next to nothing, they were determined to reestablish themselves on the land. Displaced laborers and craftsmen streamed back and forth across the country chasing scarce low-paying jobs. Some settled on small acreages in Polk County's hills.

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In 1942 the southeast quadrant of the county, including thousands of acres of fine farmland, was condemned to be used as a military cantonment. Families were again uprooted, moving into neighboring communities or into urban areas. Many of their homes and farm buildings were leveled since the cantonment was used for army maneuver and artillery practice. At the end of the war, farms were offered back to their former owners at purchase price despite shellholes, shrapnel, and unexploded bombs--but many had started new lives in distant cities and were no longer interested. Some farmers who could afford it purchased several homesteads for their sons and other returning veterans. A government-sponsored vocational school was established at Perrydale to train prospective farmers in the basics of large-scale agriculture. Airlie, located near the heart of the former cantonment, had once boasted four stores and a high school; it was eventually reduced to abandoned buildings at a rural crossroad.

Willamette Valley populations have grown steadily since World War II. Local roads have been improved, and the farm scene has changed accordingly. Polk County's farmers are now more likely to rely on local markets within and immediately adjacent to their county, rather than on distant urban centers as in the past. Traditional markets remain, however, for commercial crops sold in bulk. Farmers in the southern part of the county have closest contact with Corvallis, a university town with a population of approximately 40,000, while those in the east tend to trade with Salem, the state capitol, located just across the Willamette River in Marion County. In the central part of the county the smaller population centers of Dallas and Monmouth-Independence serve as the major in-county foci, while to the north closest contacts are often with McMinnville or Sheridan, both within a 25-mile radius. Much of the wheat and lambs for export are now trucked by the growers directly to Portland docks, whereas fruits are taken to various specialized co-operative canneries or distributors up and down the Willamette Valley.

sampling

During the months of May, June, and July of 1978 an average of four days a week were spent locating and interviewing 44 small farm operators in Polk County. A special effort was made to allow our respondents to express themselves freely--rather than remaining completely bound to the format of a lengthy questionnaire. As a result interviews typically lasted three hours, and many were much longer. Extensive notes were kept on our conversations for use in supplementing questionnaire data. By using this method, we hoped to obtain a deeper understanding of the motivations, aspirations, and special circumstances of our respondents.

Farmers from all but two areas of the county participated in this survey. Their farms encompass a wide variety of land types with various accompanying potentials and problems. The two areas not represented in the survey are one area of large farms on the northern plains and another on the former cantonment.

The sample of respondents was identified by dividing the county into five areas and selecting a minimum of eight farmers from each area. The areas were defined by geographic orientation toward different urban centers. We drove through all roads in each area, and tried to interview at least one farmer in each local community. No more than two farmers were selected from any single road, and no adjacent neighbors were included in the sample. Interviews were conducted with those whose gross farm product sales for 1977 or for a year judged to be normal were estimated to be from $1,000 to $40,000, and whose nonfarm income was estimated to be less than $20,000. A number of respondents whose farm sales were initially said to be above $1,000 in a normal year indicated later that sales for 1977 were under $1,000.[3] Those with high levels of nonfarm income were excluded from the sample because they would not be as likely as other small farmers to suffer financial difficulties. Two further qualifications were that respondents live on their farms, and that they had been farming for at least one year. For the most part, the sample reflects the different levels of gross farm product sales for the county as a whole (see table, following page).

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[3]The apparent fluctuation of gross farm product sales from year to year in this lower income range may call into question the census practice of separating out farms with gross sales under $1,000.

Annual Gross Farm Product Sales	Percent of Farms in Polk County with Sales under $40,000 N=859	Percent of Farms in Sample N=44
$20,000 to $39,999	11	11.5
$10,000 to $19,999	12	11.5
$ 5,000 to $ 9,999	14	18
$ 2,500 to $ 4,999	13	18
$ 1,000 to $ 2,499	26	14
under $1,000	24	27
	100	100

[*Source: 1974 Oregon Census of Agriculture*]
A list of demographic features of our sample is found in Appendix A. Other characteristics are presented in Appendix B.

characteristics of small-scale farmers

economic and environmental constraints

Of the 44 farmers we interviewed, 20 held an appreciable amount of bottom or terrace land suitable for irrigation. Of those 20, 9 actually irrigated pasture and hay fields from adjacent rivers, or had the equipment to do so if they wished. Naturally theirs were among the more productive mixed crop and livestock operations. At least four other farmers wanted to irrigate on an extensive scale but lacked access to water. Federal matching funds had been withdrawn just prior to this survey for two local water diversion projects--from Teal Creek and Mill Creek--that were badly needed to boost farm production throughout the county. Several farmers had invested much time and money in these now-aborted projects.

Only three of our respondents had raised vegetables or other row crops in the past, and all three had since ceased. They cited the need to hold part-time jobs, insecurity of markets without contracts, or drying up of their sources of water at critical times as limiting factors. Two other farmers planned to try raising row crops in the near future and a third was considering the possibility, but most farms with irrigation potential would face these same limiting factors. Clearly, lack of reliable irrigation was hindering many of the farmers we interviewed from entering one of the most lucrative and appropriate markets for small- or medium-scale farms: namely, vegetable production. If project water were available, they could raise vegetables full-time and be in a better position to secure market contracts.

The remaining 24 farms we visited were located on hill lands of moderate-to-steep slope. They included ten orchards, mostly cherry and prune, varying in size from 3 to 125 acres. These were among the most steadily profitable farms we found, but many were faced with a labor shortage for hand harvest. Only one orchard had trees young enough to be machine-picked.

The other 14 farms were typically in dryland pasture and hay, with some small grains and extensive woodlots. Here, the universal scourge was a noxious and prolific weed--tansy ragwort--which was first introduced in the 1930's but has since spread to endemic proportions. Poisonous to cattle and horses, it infested fields that were not cultivated every year, ruining hay crops and proving almost impossible to eradicate either by hand or spray methods.

Biological controls for tansy ragwort, cinnabar moth larvae and flea beetles, have been introduced in recent years with some success, but upland farmers generally feel that federal, state, and especially county governments have not moved fast enough to implement strong control programs against this major

threat to their livelihoods. Since windborne tansy seeds are commonly spread along county right-of-ways by passing motor traffic, farmers feel helpless in fighting the weed without county cooperation. Some claim that funds for eradication are not forthcoming because lowland farmers are not so seriously affected.

Farmers who still attempt to raise cattle usually suffer consistently higher losses than any other small farm group due to tansy-induced health problems, in addition to the familiar twin spectres of high production costs and low prices for beef. Sheep, however, can eat tansy with little ill effect. Farmers who have converted to sheep-raising generally find them more profitable, even though they reported that lamb prices tend to fluctuate even more widely than those for beef. In some of the more remote areas, however, the intensity of dog and coyote predation crippled sheep production. Farmers in those areas were awaiting federal approval of special electric fences that would keep predators out of their fields before rebuilding their flocks.

Additional hardships are visited upon farmers in hill areas near urban centers. Under original Oregon Land Conservation and Development Commission (LCDC) guidelines, much land in these areas was rezoned to five-acre-minimum rural residential classification. As land speculators and retiring farmers began to subdivide, land market values and consequently property taxes shot up several times their former levels.

At present, further proposed subdivisions are being checked by local citizens' committees and planning boards struggling to halt urban sprawl. Farmers holding hill lands in contested zones are now paying taxes well above those justified by the land's ability to produce (at current market prices). Moreover, they are unable to lower their tax pressure by subdividing, and still retain enough land on which to farm. This circumstance is particularly burdensome for retired persons on fixed incomes who wish to continue farming. It also forces some younger farmers to take jobs off the farm to support their operations, thus lowering overall farm efficiency.

For many farmers, subdivision of their land among their children is an important part of retirement plans. However, land outside designated urban growth boundaries is being rezoned either to 40-acre-minimum exclusive farm use (EFU), or to timberland-conservancy designations, rendering subdivision much more difficult.

The incomes of our respondents are not high enough to obtain significant benefits from tax write-offs, which are of great help to large-scale farmers in subsidizing the purchase of machinery and other capital investments. In other words, the lower the gross income, the lower the absolute value of the savings from a tax write-off. Limited acreage also means that farmers are unable to derive much benefit from government-sponsored crop set-aside programs and price supports. Our respondents received an average of $20 from government sources

in 1977. Accordingly, we found them to have little interest in the 1977-78 farmer's strike movement aimed at obtaining higher price supports. This attitude reflects the fact that low per-acre subsidies and price supports meant to bolster high-volume sellers do not meet the needs of the small-scale farmer.

Markets for our respondents are limited because they do not deal in large volume. We heard reports from some respondents indicating that small quantities--less than five tons--of fruit and berries, for example, were not accepted at all by some processors. Most of our respondents, either by choice or by necessity, reported selling their products in a variety of ways through independent buyers, cattle auctions, U-pick operations, and Saturday markets. Three-fourths engaged in some form of direct marketing for at least one of their products. Only one-fourth of our respondents--primarily those dealing in a relatively larger volume of sales--were bound by company contracts or agreements with marketing cooperatives. A common problem experienced by this group was cooperatives failing to pay promptly. Some have overcome this problem by processing (e.g. drying prunes) and marketing their product directly to consumers.

In three-fifths of the cases, either farm operators or their spouses were working off the farm or in home-based businesses to support their families. This circumstance prompted about one-fourth of our respondents to indicate that nonfarm jobs interfered with carrying out necessary farm work.

diversification

The typical model of a large farm is an operation highly specialized both in terms of a single product and costly machinery specifically adapted to producing that product. In contrast, small-scale operations tend to be diversified and not reliant upon heavy capital investments in any particular mode of production. Three-fifths of the respondents on our sample raised more than one kind of livestock, and about half raised more than one kind of crop. Almost all raised at least one type of livestock and one type of crop. Such diversification allows small-scale farmers to make efficient use of their own time at different periods of the production cycle in a variety of enterprises, thereby reducing the need for hired labor and/or costly machinery. The average value of machinery in our sample was $12,548 while hired labor on the average only accounted for .35 person-years of work. Half of our respondents hired no labor at all.

self-reliance

It is particularly characteristic of small-scale farmers to cut costs wherever they can, and to rely primarily on their own resources and resourcefulness. Our respondents reported deliberately avoiding patterns of operation that would commit

them to high expenditures and indebtedness to lending institutions. Only three respondents with a relatively high volume of sales were found to have taken a production loan for the 1977 crop year. One who did not take such a loan commented, "I avoid production loans; they scare the hell out of me." His neighbor had just lost his farm through default, a circumstance that was considered unbearable by most of our respondents. Less than one-fourth of our respondents had outstanding debts relating to the purchase of machinery, and even in these instances the level of indebtedness was not high--an average of $14,000. Most preferred to make their purchases outright and in so doing to acquire inexpensive, used machinery. Some of our respondents had tractors 20 or 30 years old but in good repair. In one case an old tractor was purchased in California and transported to Oregon in preference to purchasing a new, more expensive tractor closer to home. More than two-fifths of our respondents did not carry mortgages. For the remainder, the average level of mortgage indebtedness was only $36,000.

Self-reliance among our respondents was particularly evident in the fact that they produced well over half of their own food, and that they possessed a variety of mechanical and craft skills. On the average, they reported doing 80 percent of their own repairs to vehicles and machinery, and 90 percent of their own repairs to farm buildings and dwellings.

Cooperation among friends and neighbors in exchanging goods, services, and information was another aspect of self-reliance that we observed. Rather than being sold in markets, surpluses of food (especially fresh produce) were sometimes traded for labor or other types of food. When our respondents were asked to indicate their most reliable source of information about farming, "neighbors" was the most frequent answer (in 30 percent of the cases); another frequent response was that they relied on their own past experience (in 20 percent of the cases). Farm publications and the Cooperative Extension Service were listed respectively by 16 percent and 11 percent of our respondents as being their most reliable source of information.

work ethic

The work ethic is a source of self-esteem for small-scale farmers, and in their eyes sets them apart from other people. Our respondents generally could not understand and disapproved of people who live on public welfare. Large-scale corporate farmers were also recognized as being different, because their own labor on the farm was not a necessary ingredient to a successful operation. Resentment was expressed toward those who say that small-scale farmers just by virtue of being small are not serious about what they do. One respondent commented, "I work too damn hard to be called a hobby farmer." Although about three-fourths of our respondents have hobbies related to farming, farming itself was not considered to be a hobby. For three-fourths of the sample, the work ethic was evidenced by a commitment that entirely excluded interests and activities unrelated to farming.

A strong work ethic, coupled with heavy reliance on existing resources, is attributed with survival value, as it can insulate small-scale farmers against shocks administered by the larger economy. In other words, a small-scale farmer can work hard to provide more of what his family needs when times are bad, whereas a large-scale, capital-intensive farmer must either borrow more money or seek government assistance. Eighty-four percent of our respondents agreed with the statement that the survival of the small-scale farmer depends on hard work.

farming as a way of life

Most of the homes and associated surroundings of our respondents could be described as uncluttered and pleasant places to live. Although none were luxurious, many had been or were in the process of being remodeled. Consistent with such observations is the fact that 93 percent of our respondents indicated that their primary goal in farming was *to live on a farm*, while none indicated that their primary goal was *to acquire assets and wealth*. Only three respondents indicated that their primary goal was to supplement other income. The clear implication is that small-scale farmers are not profit-maximizers in the typical mode of the American businessman. Although most of our respondents made it clear that they want but are not now receiving a fair return for their effort, they still regard various elements of the lifestyle associated with farming as more important than monetary gain per se.

What element of farm lifestlye is found most attractive? The answer given by two-thirds of the small farm operators in our sample was independence--i.e., being one's own boss. In the year 1870, 65 percent of all Americans in the labor force were independent in the sense that they were self-employed, many of them on farms. In 1978 this figure stood at only 7 percent. The fact that small-scale farmers prize independence so highly might be viewed as an alternative to the type of work life experienced by most Americans. The small farm operator's goal is to integrate the functions performed by management and labor into what they consider a satisfying, unified role.

Other elements of farm lifestyle found to be attractive include doing farm work, caring for livestock, watching things grow, clean environment, peace and quiet, raising children on a farm, and generally staying away from the pressures of urban society. Two-thirds of our respondents agreed with the notion that being a small-scale farmer requires some sacrifices. It is often the case that access to shopping facilities and social activities are extremely limited in the immediate area of the farm. All of those with whom we spoke, however, seemed quite willing to forego some consumer satisfaction in order to achieve greater satisfaction as producers.

Where do small-scale farmers get the idea that farming is a desirable way of life? Two-thirds of our respondents had grown up on farms. Overall, our respondents averaged

50 years of age and 16 years operating the farm where they now live. Two-thirds had moved to farms after pursuing nonfarm occupations. More than three-fourths acquired farms by rental or purchase and did not inherit them.

commitment to farming

When our study began, we assumed that some of our respondents might wish to leave farming if they could find better opportunities elsewhere. On the contrary, we found that 41 of 44 respondents wanted to stay in farming, and expected to be in farming five years from now. Among those who felt that they would be better off if they could leave farming were two who were too old and disabled to perform farm work, and one who was forced to take a nonfarm job for financial reasons but planned to resume farming at a later time. The main problem listed by 43 percent of our respondents was not how to get out of farming and relocate, but rather how to make enough money from farming so that they could afford to stay. Four operators and five spouses were interested in seeking nonfarm jobs to supplement low farm income, but they had no intentions of leaving their farms. Most respondents appeared willing to break even or even to lose money in order to stay in farming. In a detailed analysis of cash flow we found that 63 percent of our respondents were actually losing money on their farm operations. Despite average gross farm product sales of $8,211, the average net farm revenue including land mortgage payments and property taxes was *minus* $657.[4][5][6]

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[4] It is customary for agricultural economists to include interest payments but not payments on the principal of a mortgage in the calculation of net farm income. Although we have not made this distinction in our own calculations, the bulk of the mortgage payments made by our respondents are interest payments. Original mortgages averaged $18,444, while the amount left to pay averaged $15,048.

[5] This low figure masks some advantages in savings on housing and food and a significant degree of variation within a range of $8,000 to minus $10,000. One case was significantly above $8,000. The appreciation of fixed assets also improves the financial position, though not the cash flow, of small farm owners over time. The average new worth attributed to farm assets by our respondents was $136,000.

[6] Net farm income for some of our respondents might be higher in what they regard as a "normal" year when inventories of livestock are kept at a lower level. We had no indication, however, that inventories were being kept at unusually high levels. In fact, on the average the number of cattle that were sold, consumed, or deceased almost exactly matched the number bought or born.

Most of our respondents' financial viability as small-scale farmers was enhanced by significant amounts of nonfarm income. Twenty-five farm operators were working off the farm or in home-based businesses to support their families, seventeen of these full-time. Ten spouses worked off the farm on a full-time basis. For those who did not work off the farm, supporting income was frequently obtained from sources such as pensions and investments. Nonfarm income from all sources averaged $11,917, one-fourth of this derived from pensions and investments. Given this level of outside support, it would seem that most could leave their farms if they wanted to. On the contrary, 16 of 25 operators working in nonfarm jobs stated that they would prefer to give up these jobs and farm full-time if such were financially possible. Moreover, 96 percent of our respondents agreed that farming should be preserved as a way of life, while four-fifths agreed that farming instills moral values not found in other occupations.

anti-institutional sentiment

We found evidence of anti-government, anti-institutional sentiment existing among our respondents. Three-fifths agreed with the statement that the government is the main source of farmers' problems; half agreed that government officials are not interested in the problems of the average man; and two-thirds of our respondents agreed that the circumstances of the average man are getting worse.

What reasons do they have for feeling this way? In several instances we were told about unfair buying practices of packers and marketing cooperatives that went unregulated. In other cases complaints were made about

- lack of assistance on weed and pest control problems
- the failure of public water projects
- Agricultural Stabilization and Conservation Service funds not being made available to small-scale farmers for farm improvements
- wealthy owners of large farms being allowed to build homes and being given permits for septic tanks in violation of zoning regulations
- the conducting of inspections and enforcement of picky regulations by the Occupational Safety and Health Administration and the Food and Drug Administration.

Examples of the latter include stringent regulations against one- or two-day camping by hand harvesters and the prohibition of employing strawberry pickers under 12 years old.[7] A strong complaint was registered about residential developments being allowed to take over a water system that farmers themselves had established for their own use. In one case, a couple fell victim

[7] The complaint about strawberry pickers centers more on the loss of adult laborers who could not work unless their children accompanied them.

to fraud and were forced off their land. Although the land was finally restored, they claimed that a full investigation was not made and government officials involved in the conspiracy went unprosecuted. Another respondent claimed that he may have been deliberately sold poisoned feed by a contractor-supplier and that it would cost too much to hire a lawyer and file suit. Although we are not in a position to evaluate such claims, evidence of frustration and distrust is clear.

One common source of resentment was having to fill out periodic crop reports for the government. Many of our respondents suggested that this information is used against their interests in the manipulation of agricultural markets. Letters initially accompanying the crop reporting forms were said to be nasty and threatening. The subdivision zoning restrictions mentioned earlier have also caused much bitterness about government interfering with people's right to use and dispose of their land as they please. Resentment of property taxes centered around the notion that improvements to fixed assets such as farm buildings could not be made without increasing one's tax burden. In other words, property taxes were considered a disincentive to making farm improvements.

Not all of our respondents expressed strong resentments, but considering individual experiences, recent publicity given to scandals in high levels of government, high rates of inflation in the general economy, and few financial rewards accruing to small-scale farmers, it is not difficult to understand those who do hold such sentiments.

four types of small-scale farmers

Variation within our sample of small-scale farmers seems best represented in terms of four empirically tested types. A statistical technique called cluster analysis was used as a means of clustering or grouping the cases into several different categories. Similarity of response on ten selected variables served as the basis upon which these categories were formed. The ten variables were chosen because they represent important aspects of farming strategy, and because their frequency distributions show sufficient range and variation to distinguish meaningfully among the cases. These variables are as follows:

1) amount of time the operator devoted to farming in 1977
2) amount of income obtained from operator's and spouse's nonfarm work or family business
3) percent of food consumed from the family farm and garden
4) extent of reliance on information from friends and neighbors
5) extent of marketing directly to consumers
6) number of different, broadly defined types of crops and livestock raised
7) cost of herbicide and pesticide sprays as a percent of supply costs
8) market value of machines used in the farm operation
9) farm-related debt payments made last year
10) gross income from farm product sales last year.

On the basis of our prior knowledge, we hypothesized that four categories or types of small-scale farmers would emerge from the clustering procedure. Generally speaking, the four types were expected to be:

I. part-time farm operators with relatively low time commitments to farm work and relatively heavy reliance on nonfarm work as a source of income;
II. alternative agriculturalists whose production and marketing strategies differ from conventional patterns;
III. retirees and older persons who are restricted both in their capacity to engage in commercial farming and in their capacity to support themselves by working off the farm; and
IV. aspiring commercial farmers with at least some characteristics that, to a relatively greater degree, resemble those of large-scale farmers.

Altogether, 42 of 44 cases were subjected to cluster analysis (2 cases were excluded because of missing information). As hypothesized, four distinct groups emerged based on similarities among the cases. In order to describe the salient characteristics of four types of small-scale farmers, the statistical variation among the groups was analyzed, both with respect to the ten variables listed above, and with respect to an additional set of variables which also indicate important differences among the groups. (The results of four-way analysis of variance pointing up significant differences among group means is presented in Appendix C.)

type I: part-time rural residential farmers

The distinguishing features of type I farmers are that they spend proportionally more time devoted to nonfarm work, earn more income (including spouse's income) from nonfarm work, and spend less time in farming activities than other types of small-scale farm operators. It is likely that these operators have full-time jobs and farm primarily during evenings, weekends, and vacations. All respondents in this group raise beef cattle and, more often than other farmers, are inclined to market their product through a cattle auction. They often carry farm mortgages and have a relatively low net worth when both farm and nonfarm assets and debts are considered. Income from product sales is enough to cover most of what is paid for mortgage and property taxes, but on the average it is much lower than similar income received by respondents in the other three groups. Their farms and gardens also provide a lower percentage of food consumed by the family. For this group, the farm seems to be more important as a residence than as a base of subsistence.

type II: alternative agriculturists

Type II farmers can be primarily characterized as attempting to avoid the commercial mode of production and marketing. They use very little herbicide and insecticide, and more frequently market their products locally--either direct to consumers or to local buyers. Their interests in various types of information suggest that they would favor crop rotation as a means of soil maintenence over the use of commercial fertilizer, and labor-intensive practices as opposed to the use of heavy machines. In addition to marketing locally, they often depend on neighbors for information. Their involvement in the local community seems to be related to a greater degree of general optimism about the future. Although not particularly old, this group includes a number of persons who have retired early from other occupations. This group also includes several farmers with relatively large numbers of sheep. Despite the operator's heavy commitment of time to farming activities, the spouse and other family members tend to have relatively little involvement in farm work. Thus, farms associated with this group are largely one-person operations.

type III: older farmers and retirees

Several attributes of type III farmers distinguish them from the other types of small-scale farmers. Members of this group are either retired from a nonfarm occupation or partially retired from farming itself. Their average age is 63, and they often depend upon social security and pensions as sources of income. In contrast to the other groups, they receive little income from nonfarm work or a family business. Most persons in this group are no longer burdened with paying off a mortgage and have accumulated more assets. In particular, their net farm and nonfarm assets are worth significantly more than those of other respondents. Perhaps because of their limited opportunity

to generate nonfarm income, however, they are more likely to feel that property taxes are too high. When compared with type II farmers, they show much less inclination to deal with neighbors and customers, and express a more pessimistic outlook on the future.

Most female farm operators among our respondents are included in this group. This circumstance can be explained by the fact that female operators tended to be elderly, widowed, or sole-providers for their families. They were similar to retirees in their lack of opportunity to generate nonfarm income, and in their relative degree of social isolation on the farm.

type IV: aspiring commercial farmers

Type IV farmers differ most from the norms earlier established for small-scale farmers as a group. First, they have a relatively high level of gross sales, including an atypical emphasis on cash crops and in some cases a tendency to market these crops through cooperatives. Second, they have made much heavier investments in machinery and irrigation, thus indicating that their farms are more capital-intensive and are operated on a larger scale. Third, they have placed themselves in debt with mortgages and equipment loans to a greater extent than other respondents and must farm commercially to earn enough to make their payments. Fourth, they rely more heavily on the use of commercial fertilizers and sprays to sustain or increase production.

The average age of type IV farmers is 43 years--much younger than other respondents. Family labor requirements are higher, perhaps because of greater diversity and more prolonged harvest activity. It is interesting to note, however, that these operators devote less time to farming than type II and type III operators. Since net gains--even excluding mortgage payments and taxes as costs--are not high, they must often devote a significant amount of time to nonfarm work, and many rely heavily upon nonfarm income for support. Not surprisingly, members of this group more frequently expressed a need to find nonfarm work. Transport to markets and reliance on cooperatives to buy their products are special problems for this group. Despite the fact that most members of this group view farming as a means of acquiring wealth, they seem to occupy the most unstable position of the four types of small-scale farmers. Those type IV farmers who attempt to rely most on the farm for income seemed to be the most burdened financially.

This type of farmer may represent a transitional or intermediate phase between a large-scale commercial farmer and one of the other three types of small-scale farmers. Despite some characteristics of the former, these farmers still more closely resemble the small farmer because they operate on a much smaller profit margin than a large-scale commercial operator.

No significant differences among the four groups emerged regarding such variables as: number of acres operated, whether or not they had had formal agricultural training, occupational background, or place of origin.

an approach to assistance programs

The characteristics and problems of small-scale farmers described here suggest some general guidelines and approaches that might be followed in assistance programs.

1 It must be recognized that small-scale farmers have a legitimate place in the local economy. Many constraints experienced by small-scale farmers could, perhaps, be overcome if the entire American market economy and tax structure were overhauled. In the absence of this prospect, however, it would be helpful to reexamine local zoning ordinances and how they affect the small-farm operator. A first step might be to make the first zoning prerequisite *serious farm use*, rather than the size of the land parcel. Having zoning variances reviewed by *truly representative bodies* would also be a positive goal, hopefully making smaller parcels of bottom land available for intensive farming and protecting valuable uplands from suburban sprawl for fruit and berry growing.

Another step that could be taken would be to provide financial and organizational support for *local irrigation projects* to facilitate the cultivation of row crops. *Low cost* technology, alternative sources of energy (such as solar and wind power), and organic or labor-intensive farming methods could also be introduced in assistance programs for small-scale farmers to reduce costs and overcome constraints imposed by limited income and capital. Despite a general lack of knowledge on the subject, our respondents seemed receptive to this kind of information--three-fifths indicated that information on alternative energy would be useful, and 86 percent indicated that information on biological pest and weed control would be useful. The importance of such an approach is underscored by the fact that reducing the cost of supplies was the most frequently expressed need among our respondents (three-fourths indicated that this was an important need).

Finally, assistance programs should provide more opportunities for direct marketing in small volume units. The second most important need expressed by our respondents--in almost two-thirds of the cases--was to find better marketing opportunities. If the kinds of steps described here are taken to assist the small-scale farmer, we believe not only that the economic handicaps of the small farmers can be overcome, but also that operation on a small scale can be turned into an economic advantage.

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2 Production models should be developed for small-scale farmers to find optimal solutions in the use of diversified farming strategies. It cannot be assumed that the specialized production models developed for large-scale farmers are appropriate for those who farm on a much smaller and less capital-intensive scale. It was suggested to us by several respondents that information on older livestock and crop varieties, better suited for diversified agriculture without costly feed or chemical requirements, were needed; in other words, traditionally effective agricultural techniques need to be recovered and applied. Another suggestion was to tap European and Asian know-how for domestic small-farm use.

It was also suggested that small-scale operators might improve their net gains somewhat by focusing on specialty products, such as registered breeds of livestock or high quality crops that require labor-intensive care. These kinds of products would not only command a higher price in the market, but also might open up entirely new markets for small-scale producers. Feasibility studies and local experimentation both in production and marketing are needed in order to determine which specialty products would be most successful.

3 Any changes in assistance programs that serve to increase the self-reliance of small-scale farmers are likely to be well-received. It would be most appropriate in this regard for technology to be simple enough to be installed, repaired, and adapted to individual needs by the farmer himself. New methods should be introduced in a way that allows neighbors and friends to experiment individually, as well as to learn from each other's experiences.

4 Since small-scale farmers have a strong work ethic, it must be recognized that they would not be interested in welfare-type programs that would not only make them dependent on the government but would also rob them of their self-esteem. Neither can they be dismissed as not being serious about farming and therefore unworthy of assistance simply because they may have limited objectives regarding income and scale.

5 On grounds of principle, small-scale farmers who value farming as a way of life would object to carrying out any changes that would threaten this way of life. For this reason they do not have aspirations to become businessmen by farming on a large commercial scale. They do not regard themselves either as failures or as a doomed species just because of their size. Thus, in approaching small-scale farmers, it is imperative that they be recognized as a group distinct from large-scale commercial farmers. They are indeed different and have different needs, as discussed in this paper.

6 A strong commitment to living on their land suggests that permanent improvements in land and property would be regarded by small-scale farmers as worthwhile investments. Previous farm background shared by most and the desire to stay in farming in spite of some hardships further suggest that most small farmers would not easily be persuaded to give up and leave. Moreover, the self-reliance that insulates them to some extent from the shocks of the larger economy reduces the probability of such an occurrence.

7 Anti-institutional sentiment could be softened by eliminating crop reporting requirements and disincentives to farm improvements in the tax structure. As far as the Cooperative Extension Service is concerned, programs should be structured such that small-scale farmers themselves participate in program planning, and retain some control as the program develops. This kind of approach would ensure that the program benefits the small-scale farmer, for whom it is intended, and could build upon cooperation already existing in the trading and exchange of information between neighbors. In this regard, the emergence of formal or informal groups for joint purchase of supplies, joint harvesting, or joint marketing should be encouraged and, where lacking, the feasibility of forming such groups should be explored. Indeed, four-fifths of our respondents expressed interest in participating in an organization of small-scale farmers.

The variation among small-scale farmers must be taken into account if their needs are to be served. Type I farmers, for example, must spend more time working off the farm; since they cannot devote much time to additional activities, they might be expected to keep their involvement in new programs to a minimum. Special effort would be needed in reaching out to this group. Type II farmers have fewest farm assets and would be most resistent to a conventional capital-intensive approach to increasing production, but at the same time they might be open to new ideas and inclined to engage in cooperative efforts within naturally existing networks of small-scale farmers. Type III farmers seem to be more individualistic, and would perhaps respond best to whatever would reduce costs and increase their self-reliance. They should be expected to exhibit a more skeptical attitude toward public agencies. Type IV farmers are more highly motivated to achieve financial gain. Given their heavier investments and higher costs, their most pressing needs would be finding more lucrative markets and generating additional family income.

Each farmer will have his own unique configuration of needs, but these general patterns of variation might be helpful in designing an effective assistance program. The suggestions made here have been kept general for a purpose. We feel that the overall approach of the Cooperative Extension Service to small-scale farmers must be quite innovative and flexible. Moreover, despite prevailing anti-institutional sentiment, only 16 percent of our respondents expressed an unfavorable opinion of the Cooperative Extension Service, and 30 percent expressed a desire for more frequent contact with their extension agent. Clearly, an opportunity exists to serve this group.

conclusion

A small farm tradition with several distinct strategies is evident from our long talks with 44 farmers and their families. It is a fundamentally American way of life, etched out by hard work and determination. The tantalizing dream of inward peace, satisfaction, space, and personal freedom beckons to the small farm operator--yet the threat of failure is imminent. Many seemingly uncontrollable obstacles cloud the future for the small-scale farmer:

- low and widely fluctuating prices
- inflated costs
- pests and weeds
- intrusion upon their land base
- government at cross-purposes or over-regulating
- unforeseen injury or health problems.

It is for such reasons that three-fourths of our respondents agreed with the notion that opportunities for small-scale farmers will decrease in the future. However, with the support of that portion of the larger American community that shares their values, a bridge of cooperation may be built that will allow small farmers' aspirations to be fulfilled.

One of our most elderly and optimistic respondents, who had lived his entire life in the same community and had long acted as one of its leaders, glanced up at our question: *Would opportunity for small-scale farming decrease in the future?*

"Those people moving back into the country for the quality of its life will cause the rebirth of our rural communities," he said. "I'm sure of it."

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appendix a

Demographic Features of the Sample

title	distribution	number of cases n=44
age of operator (mean = 50)	age 29 to 38	11
	age 39 to 48	9
	age 49 to 58	11
	age 59 to 77	13
sex of operator	male	39
	female	5
birthplace of operator	Polk County	12
	other Oregon county	6
	other state	26
place operator lived before age 18	Polk County	14
	other Oregon county	9
	other state	21
operator raised on farm	fully	24
	partially	7
	not at all	13
last year operator completed in school	8-11	9
	12	21
	13-20	14
operator's marital status	married	38
	separated	1
	divorced	2
	widowed	2
	single	1
number of children in household (mean = 1.5)	none	11
	1-2	24
	3-5	9
number of children contributing significantly to farm (mean = 1.0)	none	18
	1-2	21
	3-4	5
main product	sheep	17
	beef	15
	fruit	11
	grain	5
	berries	1
	goats	1
	hogs	1
	milk	1
	worms	1

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appendix b

Table 1. current employment other than farming (1977)

title	operator (n=44)	spouse (n=40)
no outside employment	19	21
farm laborers	1	
other laborers	3	1
transport operators	1	
factory workers	5	
self-employed craftsmen	2	1
machinists	2	
construction craftsmen	2	
mechanics	3	
clerical and administrative	2	3
self-employed administrative	2	
teachers and other professionals	2	8
health workers		4
service and food		2

Table 2. time devoted to farm and off-farm work (1977)

title	operator		spouse	
	farm	off-farm	farm	off-farm
none		22	2	24
minimal			13	1
1/4-time	13	1	12	1
1/2-time	12	2	9	6
3/4-time	5	3	2	2
full-time	14	16	2	6

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Table 3. operators and spouses employed off farm

title	operator (n=25)	spouse (n=19)
off-farm income necessary supplement to farm income	20	7
would be forced off farm without outside income	19	5
prefer to engage exclusively in farm work	16	9
off-farm work regarded as more important than farm work	13	5
could find additional time to work off farm (some)	4	2
off-farm work interferes with farm work	12	2

Table 4. operators and spouses engaged in farm work only

title	operator (n=19)	spouse (n=21)
has time for off-farm employment	7	5
interested in finding off-farm employment	7	10
off-farm work would interfere with farm operation	7	12

Table 5. formal training in agriculture

title	operator (n=44)	spouse (n=40)
none	22	39
FFA, YFA, 4-H	11	3
college course	5	2
college major	2	
CES short course	4	

Table 6. formal training related to farming

title	operator (n=44)	spouse (n=40)
none	25	29
mechanics	10	2
business	3	9
agricultural science	4	
other	2	4

Table 7. organizational membership

title	operator* (n=44)	spouse* (n=40)
veterans	4	1
social or fraternal	11	11
civic	7	1
farm	21	9
trade	12	5
church	25	26
voluntary or elected	10	8

*multiple affiliations = greater than 100%

Table 8. involvement with local problems

title	operator (n=44)	spouse (n=40)
communicated with public officials	30	21
signed a petition	27	28
attended meetings	36	25

Table 9. sources of information

most reliable	source	value: none	little	some	lot
13	neighbors, friends, relatives	7	6	15	16
9	own past experience	6	8	24	6
7	farm publications	5		12	27
5	county agents (CES)	1	12	27	4
4	own experimentation	9	5	14	16
1	commercial salesmen	43			1
2	other	34	1	3	6
44					

Table 10. marketing

main market		frequency (amount used): none	little	some	lot
13	auction	26	2	2	14
9	direct to consumer	10	7	10	17
9	local buyers	25	2	6	11
6	cooperative agreement	34	2	1	7
5	contract to company	38		1	5
2	none				
44					

Table 11. farming goals

goal	stated interest (multiple response)	most important (single response)
live on farm (rural tradition)	41	31
supplement income	21	4
maintain independence	10	2
raise children	8	2
only skills operator has	3	1
preserve family farm	8	1
seclusion	5	1
can't afford to sell	2	
retirement security	6	
like to grow things	7	
acquire assets and wealth	14	
pleasure, hobby	16	
undecided		2
		44

Table 12. what operator and spouse like most about farm life

title	operator (n=44)	spouse (n=40)
independence	21	7
farm work	9	2
wholesome environment	6	8
peace and quiet	6	9
good place to raise children		5
other reasons	2	5
	44	36

Table 13. unmet needs or need for

item	important	middling	unimportant
reducing cost of supplies	34	4	6
finding better markets	28	5	11
reducing cost of machinery	27	6	11
reducing cost of repairs	25	3	16
acquiring latest farming information	23	7	13
obtaining hired labor	16	1	27
gaining access to irrigation water	15	3	26
getting cooperation of neighbors	11	6	27
obtaining farm credit	11	3	30
obtaining off-farm work	7	1	36

Table 14. information needed

item	important	middling	unimportant
biological pest and weed control	33	5	6
soil testing	32	5	7
commercial fertilizer application	31	3	10
economics of farm management	30	4	10
chemical pest and weed control	30	3	11
water use	26	5	13
alternative energy sources	23	3	18
composting, recycling	19	10	15
intercropping, crop rotation	17	6	21
use of heavy machinery	10	6	28

Table 15. marketing problems

item	important	middling	unimportant
price fluctuation	33	2	9
lack of price information	22	4	18
lack of direct marketing opportunity	17	3	24
meeting commodity grading requirements	13	2	29
lack of adequate storage facilities	13	2	29
competition from big operators	12	5	27
inspection and sanitary regulations	10	2	32
transportation costs	9	5	30
finding a wholesale broker	9	2	33
spoilage during transportation	4	2	38

Table 16. main problem staying in farming

response	number
low income	13
high production costs	6
need to upgrade farm	5
unfair zoning, high taxes	5
old age	5
successive crop failures	1
lack of farming know-how	1
too small	1
other	3
none	4
	44

Table 17. opinions

statement	strongly	agree	neutral	disagree	strongly
farming in this country should be preserved as a way of life	21	21	1	1	
survival of the small farmer depends primarily on his own hard work	9	28	2	5	
operating a family farm is a way of maintaining one's independence and freedom	15	21	4	3	1
family farming instills moral values not commonly found in other occupations	9	27	6	2	
the risks and uncertainties forced on a small farmer make it difficult to plan for the future	11	19	3	11	
the lot of the average man is getting worse	7	23	5	9	
a person must give up some economic and social advantages to be a small farmer	5	25	4	8	1
the government is a main source of problems for the small farmer	9	17	10	8	
the world is run by a few powerful people and there's not much the little guy can do about it	5	16	4	16	3
public officials really aren't interested in the problems of the average man	3	18	7	16	
sometimes the best way to deal with a problem is to trust it to fate	1	7	3	25	8

Table 18. acreage distribution

	acres						
	none	1-10	11-25	26-50	51-100	101-200	201+
acres owned	1		10	10	13	10	
acres rented out	32	2	5	2	2	1	
acres rented in	28	4	3	3	2	1	3
total acres operated		3	9	7	14	6	4

Table 19. crop inventory

	acres planted					
production	1-10	11-25	26-50	51-100	101-200	201+
pasture (n=34)	9	10	8	2	2	
hay (n=29)	10	7	8	3	1	
grain (n=16)	2	6	6		2	
orchard (n=13)	7	4		1	1	
vine (n=3)	3					
xmas trees (n=2)	2					

	tons sold					
production	1-10	11-25	26-50	51-100	101-200	201+
hay	2	3	1	1	1	1
grain	1	3	4	1		2
orchard	4	1	1	1		2
vine	2	1				
xmas trees	(100 & 200 trees respectively)					

	tons consumed					
production	1-10	11-25	26-50	51-100	101-200	201+
hay	5	8	12	2	1	
grain	3	5		1		
orchard	*					
vine	*					
xmas trees	*					

*minimal amount

table 20. livestock inventory

production	beef	sheep	dairy cows	hogs	goats	chickens & fowl	horses
	n=31	n=15	n=8	n=6	n=3	n=15	n=11
no. owned now							
1-10	11	2	4	5	2	5	10
11-25	9	3	4		1	5	1
26-50	10	3				4	
51-100		5		1			
100+	1	2				1	
no. bought last year							
1-10	5	3		2			
11-25	1	1					
26-50	1	1					
51-100	1						
no. born last year							
1-10	16	3	2				
11-25	5	1	2				
26-50		5					
51-100		5		1			
no. sold last year							
1-10	14	4	3	1			
11-25	4	3					
26-50	1	2					
51-100	1	3		1			

Table 21. mortgage payments (1977)

amount	response
$0	22
$800-1,500	5
$2,000-2,800	7
$3,000-4,500	6
$4,800-6,000	3
mean = $1,365	n=43

Table 22. taxes on farm property (1977)

amount	response
$0	2
$125-500	8
$575-775	10
$800-1,225	12
$1,300-2,000	9
$2,700-3,000	2
mean = $975	n=43

Table 23. total farm expenses (1977)

amount	response
$1,000-2,500	8
$3,500-5,000	9
$5,400-8,000	10
$8,100-12,000	10
$14,000-33,000	6
mean = $8,789	n=43

Table 24. net farm revenue (1977)

amount	response
$-12,000-$-7,000	6
$-4,500-$-100	21
$0-4,000	8
$4,500-8,500	7
$20,000-25,000	1
mean = $-657	n=43

Table 25. operator's income from nonfarm wage labor (1977)

amount	response
$0	21
$600-5,000	4
$6,000-10,000	5
$12,000-23,000	12
mean = $5,893	n=44

Table 26. spouse's income from nonfarm wage labor (1977)

amount	response
$0	22
$600-4,900	11
$6,000-10,000	3
$12,000-23,000	4
mean = $2,902	n=40

Table 27. family income from social security, pensions, annuities (1977)

amount	response
$0	29
$2,000-4,800	7
$5,000-10,000	7
mean = $1,751	n=43

Table 28. income from family business (1977)

amount	response
$0	39
$3,000-7,000	3
$15,000-20,000	1
mean = $749	n=43

Table 29. net household income (1977)

amount	response
$-5,000-0	1
$2,000-4,800	4
$5,000-9,800	7
$10,000-14,800	9
$15,000-19,800	7
$20,000-24,800	7
$25,000-35,000	1
mean = $12,188	n=43

Table 30. market value of land and buildings

amount	response
$0	2
$30,000-90,000	12
$100,000-175,000	16
$200,000-250,000	12
$300,000-400,000	1
mean - $134,102	n=43

Table 31. market value of machinery and equipment

amount	response
$0-500	6
$2,000-8,000	22
$10,000-20,000	10
$44,000-75,000	5
mean = $12,548	n=43

Table 32. amount owed on farm mortgage

amount	response
$0	21
$5,000-16,000	9
$20,000-45,000	10
$50,000-100,000	3
mean = $15,048	n=43

Table 33. amount owed on machinery and equipment

amount	response
$0	32
$300-8,000	8
$13,000-30,000	3
mean = $2,317	n=43

Table 34. total farm indebtedness

amount	response
$0	16
$300-9,000	7
$11,000-30,000	11
$38,000-65,000	8
$100,000-150,000	1
mean = $17,389	n=43

Table 35. farm net worth

amount	response
$1,000-10,000	2
$20,000-55,000	4
$60,000-99,000	11
$100,000-145,000	10
$160,000-220,000	11
$240,000-300,000	4
$350,000-400,000	1
mean = $135,685	n=43

appendix c

Analysis of Variance Among Four Groups of Small-Scale Farmers[1/]

variable (starred variables were used in cluster analysis)	type I (n=11)	type II (n=10)	type III (n=8)	type IV (n=13)	F	sig.
operator is retired from nonfarm occupation 1=yes 0=no	0.09	0.50	*0.75*	0.15	5.24	0.0040
age of operator	50.54	50.54	*62.62*	*43.46*	4.51	0.0084
sex of operator 1=female 2=male	2.00	2.00	*1.62*	1.92	3.71	0.0194
farm is mortgaged 1=yes 0=no	0.73	0.50	*0.13*	0.69	3.16	0.0355
raise beef cattle 1=yes 0=no	*1.00*	0.67	0.50	0.54	2.81	0.0528
raise pigs 1=yes 0=no	0.0	0.10	0.0	*0.31*	2.54	0.0709
number of sheep now owned	8.54	*57.90*	14.87	13.23	2.46	0.0768
number of types of crops and livestock*	2.90	2.90	3.00	*4.38*	2.38	0.0840
total acres in crops (1977)	18.46	34.30	24.13	*61.46*	2.24	0.0994
acres in irrigated crops (1977)	2.55	6.80	0.0	*18.62*	2.24	0.0995
amount of time operator devoted to farming (1977)* 5=max 0=min	*2.36*	4.20	4.12	3.38	7.41	0.0005
amount of time operator devoted to nonfarm work (1977) 5=max 0=min	*4.27*	1.20	*0.37*	2.53	7.45	0.0005
person-years of family labor in farm (1977)	0.74	0.83	1.17	*1.65*	7.23	0.0006
spouse's duties include driving a tractor 1=yes 0=no	0.18	0.0	*0.63*	*0.46*	4.20	0.0117
number of hours operator worked a nonfarm job week before the interview	*31.82*	12.80	*5.00*	18.39	3.94	0.0153
percent of food consumed from the family farm and garden*	*38.36*	64.00	59.37	63.69	3.85	0.168
number of months of harvest activity (1977)	0.86	1.27	1.33	*3.25*	3.14	0.0367

[1/] type I - part-time rural residential farmers
type II - alternative agriculturists
type III - older farmers and retirees
type IV - aspiring commercial farmers
Numbers in italics are of particular interest in defining farmers of each of these types.

variable (starred variables were used in cluster analysis)	type I (n=11)	type II (n=10)	type III (n=8)	type IV (n=13)	F	sig.
extent of marketing through a cooperative 3=max 0=none	0.0	0.20	0.75	1.31	3.71	0.0196
extent of marketing directly to consumers* 3=max 0=none	1.54	2.60	1.00	1.76	3.25	0.0321
extent of marketing through an auction 3=max 0=none	2.09	0.90	1.12	0.53	2.92	0.0460
extent of marketing to local buyers 3=max 0=none	0.63	2.00	1.12	0.84	2.34	0.0887
information about the use of heavy machinery would be useful 1=max 5=min	3.63	4.80	4.25	2.61	6.22	0.0015
extent of reliance on information from friends and neighbors* 3=max 0=none	2.09	2.40	0.75	1.92	5.03	0.0049
information about the application of commercial fertilizer would be useful 1=max 5=min	1.81	3.20	1.75	1.92	3.61	0.0271
information about crop rotation would be useful 1=max 5=min	4.00	2.40	4.00	2.76	3.12	0.0369
extent of reliance on one's own past experience 3=max 0=none	2.46	1.80	2.88	2.62	2.69	0.0598
cost of transporting product to market is a problem 1=max 5=min	3.63	4.40	4.37	3.07	2.49	0.0747
obtaining nonfarm work is an unmet need 1=max 5=min	4.63	4.40	4.75	3.46	2.37	0.0852
extent of reliance on information from farm publications 3=max 0=none	1.72	2.00	1.00	1.84	2.31	0.0909
original amount of intermediate loans for machinery	0.0	1,200.00	1,500.00	9,130.76	4.54	0.0081
cost of insecticides (1977)	23.36	16.20	56.60	487.39	4.29	0.0106
amount currently owed on intermediate loans for machinery	90.90	1,080.00	43.75	6,730.76	4.05	0.0136
total farm expenses (1977)	5,357.91	7,305.30	6,571.38	1,4331.85	3.60	0.0220
fertilizer and spray as a percent of total farm costs (1977)*	9.98	2.17	5.16	16.19	3.46	0.0259
cost of herbicides (1977)	58.55	16.50	25.50	239.46	3.02	0.0412
cost of machine maintenance (1977)	176.82	260.40	542.75	861.92	2.56	0.0694

variable (starred variables used in cluster analysis)	type I (n=11)	type II (n=10)	type III (n=8)	type IV (n=13)	F	sig.
current market value of machinery*	6,172.72	6,865.00	6,562.50	26,948.07	5.99	0.0019
current farm and nonfarm assets	107,677.09	122,488.90	217,375.63	170,151.54	3.78	0.0182
current market value of farm and nonfarm assets	125,914.09	134,808.90	225,418.13	201,843.85	3.44	0.0263
current farm net worth	103,768.00	103.719.20	188,876.25	163,354.62	3.17	0.0353
current market value of farm assets	121,777.73	114,799.20	196,918.75	189,239.23	3.02	0.0417
operator's income from nonfarm work (1977)	12,376.27	3,855.00	562.50	6,163.74	6.13	0.0017
total gross farm income (1977)	2,688.09	6,389.70	4,872.63	16,710.00	4.19	0.0118
gross income from product sales (1977)*	2,108.81	6,084.60	4,570.12	14,666.46	4.04	0.0137
income from crop sales (1977)	254.00	2,568.30	1,986.50	11,362.15	4.03	0.0139
income from social security, pension, and annuities (1977)	800.00	2,954.10	3,869.00	463.46	3.86	0.0166
operator's and spouse's income from nonfarm work and family business (1977)*	13,912.63	8,741.40	2,762.25	10,159.84	3.66	0.0205
total net farm income excluding mortgage payments and property taxes (1977)	-295.91	1,275.10	-209.13	6,726.69	3.33	0.0295
gross farm income not from product sales (1977)	579.27	305.10	302.50	2,043.54	2.68	0.0608
one goal in farming is to acquire wealth 1=yes 0=no	0.0	0.30	0.25	0.61	4.36	0.0098
agree that the lot of the average man is getting worse 1=max 5=min	2.27	3.10	1.63	2.46	4.17	0.0120
suggested lower property taxes as a way of helping small-scale farmers 1=yes 0=no	0.27	0.0	0.50	0.08	3.40	0.0273
operator has communicated with public officials about local problems 1=yes 0=no	0.45	0.60	0.87	0.92	3.01	0.0419